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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/673,401

09/30/2003

Naoyuki Koizumi

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03/25/2005

STAAS & HALSEY LLP

SUITE 700

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WASHINGTON, DC 20005

EXAMINER

ROMAN, ANGEL

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

EL

Office Action Summary	Application No. 10/673,401	Applicant(s) KOIZUMI, NAOYUKI	
	Examiner Angel Roman	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/30/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I claims 1-4 in the reply filed on 03/03/05 is acknowledged.

Information Disclosure Statement

2. The examiner has considered the references submitted in the information disclosure statement filed 09/30/03.

Oath/Declaration

3. The Declaration documents filed 09/30/03 are acceptable.

Drawings

4. The Drawings filed 09/30/03 are acceptable.

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract

on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The abstract of the disclosure is objected to because it exceeds 150 words. Correction is required. See MPEP § 608.01(b).

Claim Objections

7. Claim 1 is objected to because of the following informalities: In line 14 the limitation reading "the one face thereof" should be replaced with --the one face of the semiconductor element-- and in line 15 "the other face thereof" should be replaced with --the wiring board mounting face-- in order to provide distinction and clarity in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 1, 2 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by McCormick U.S. Patent 6,369,448 B1.

Regarding claim 1, McCormick discloses a semiconductor device 400 having an additional functional element 412 comprising; a semiconductor element 410, at least on one face of which first and second electrodes are arranged; a wiring board 402 having first and second connection pads on a face of which the semiconductor element 410 is mounted; connection means 414 for electrically connecting the first electrode with the first connection pad so that a small gap can be formed between the one face of the semiconductor element 410 and the mounting face of the wiring board 402 when the one face of the semiconductor element 410 is arranged being directed toward the mounting face of the wiring board 402; and an element 412 having a specific additional

function arranged in the gap formed between a region of the second electrode of the semiconductor element 410 and a region of the second connection pad of the wiring board 402, wherein the additional functional element 412 is connected with the second electrode on the one face of the semiconductor element 410 and also connected with the second connection pad on the wiring board mounting face so that a specific electric function can be exhibited.

Regarding claim 2, McCormick discloses solder bump connection means, one face of the additional functional element is connected with the second electrode by means of ultrasonic connection, anisotropic conductive adhesive film or anisotropic conductive adhesive paste, and the other face of the additional functional element is connected with the connection pad by means of soldering (see column 4, lines 9-22 and 45-67).

Regarding claim 4, McCormick discloses the additional functional element being an extremely thin type passive element or active element, or alternatively the additional functional element is an extremely thin type capacitor, resistor or inductance (see column 7, lines 1-63).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over

McCormick U.S. Patent 6,369,448 B1.

Regarding claim 3, McCormick discloses third and fourth electrodes arranged in a central region other than the second electrode, the additional functional element is arranged in the gap defined between the central region of the semiconductor element 410 and the wiring board 402, and the third and the fourth electrodes are electrically connected with third and fourth connection pads on the wiring board 402 through a plurality of conductive vias penetrating from one face of the additional functional element 412 to the other face thereof (see column 7, lines 25-29).

McCormick is applied as above but lacks anticipation on describing the outer electrodes as being used for power supply and grounding. It would have been obvious

to a person having ordinary skills in the art at the time the invention was made to describe the outer electrodes in the primary reference of McCormick as being power supply or grounding electrodes since power supply and grounding electrodes are conventional in functional electric devices.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tosaki et al., Avery et al., Miyoshi et al., Klein et al., Tago, Li, Harper et al. and Farooq et al. disclose semiconductor devices having additional functional elements bonded in gaps between semiconductor elements and wiring boards.


14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel Roman whose telephone number is (571) 272-1681. The examiner can normally be reached on Monday-Friday 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AR
March 18, 2005



MICHAEL LEBENTRITT
SUPERVISORY PATENT EXAMINER